CERN/AC/21
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ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

ADVISORY COMMITTEE ON VISITING TEAMS

Fifth Meeting

Geneva - 6 October, 1959

EXPERIMENTAL PROGRAMME OF THE SC FOR VISITING AND CERN TEAMS

7456/p

INTRODUCTION

In this document are listed all the experiments that are in progress in the Synchro-Cyclotron Division or for which time has been requested. Experiments of CERN groups and visiting teams are collected separately.

These lists are followed by a table (Annex I) showing the manner in which the cyclotron running time was divided up among the experimental groups during the period April 1959 - September 1959 inclusive. The preliminary schedule up till the end of the year is also given.

Annex II is a proposal for the cyclotron time allocation during the first months of 1960.

It will be noted that during the second half of 1959 the percentage of the cyclotron running time allocated to the visiting teams amounted to rather less than 30% of the total. There were several reasons for this :

1) The CERN teams leaving the SC Division at the end of 1959 were given the opportunity to finish their experiments before this time limit.

2) There werefurther difficulties with the production of the external π^+ beams.

3) Visiting teams were not always ready to start their experiment when machine time was available.

In the proposed time allocation for the first months of 1960 the percentage of the total running time available to the visiting teams has been increased to 40%. It is the intention to continue this policy throughout 1960 up till the moment that the loss of running time by the visiting teams (on the basis of 30% of the total) has been made up for.

From 15 November 1959 to 1 February 1960, a period of two and a half months, the cyclotron will be shut down for major alterations in the outlay of the shielding wall on the neutron side of the cyclotron and for a thorough overhaul of the machine itself. The focusing lenses of the μ -meson channel will be built in during this period and the outlay of the channels for the internally produced pions will be substantially modified (sketch Annex III). The first two weeks after this shutdown are reserved for tests on the μ -meson channel and for final work on the externally produced π^+ beams.

Experiments with the CERN cyclotron planned by CERN Teams

Situation mid September 1959

Budget code no.	Group	Type of experiment	Total no. of shifts required	Remarks
310	A. Citron	μ-meson scattering at high energies up to 250 MeV by various nuclei	6 weeks	Quadrupole magnet channel and analysing magnet to be installed January 1960
311	L. Ledermann F.J. Farley	Measurement of g-2 of muon	15 weeks	Tests on storage in a flat magnet show promising results
321	E. Zavattini	Mass difference π^-, π^o has been determined ($9.01 \pm 0.08\ m_e$). a) Parity non-conservation in $\pi^- + p \rightarrow n + \pi^o$ b) $\pi^- + p \rightarrow n + \gamma$	40	a) This experiment dropped because intensity too low b) Reaction well established and measurements in progress
322	A. Merrison G. Fidecaro	$\mu \rightarrow e + \gamma$ and $\mu \rightarrow e + \nu + \bar{\nu} + \gamma$		Successfully finished. The group is now preparing an experiment with the P.S.
323	A. Lundby	$\mu^- + C^{12} \rightarrow B^{12} \rightarrow C^{12} + \beta^-$	24	Angular distribution of β in hexane and diamond found isotropic. Future experiments apply strong magnetic field on the diamonds

Budget code no.	Group	Type of experiment	Total no. of shifts required	Remarks
324	D. Harting J. Kluyver	$p + d \rightarrow H^3 + \pi^+$ $p + d \rightarrow He^3 + \pi^o$ } to check charge independence		Practically finished, a check run might be required. The group will then prepare a new experiment with the S.C.
341	M. Goebel	Measurements of yield and energy of secondary particles such as tritium and He^3	35	Work well in progress
342	G. Rudstam	Spallation and fission experiments Radiochemistry	15	An isotope separator is being provided for study of nuclear reactions
350	W. Gibson	$p + d \rightarrow H^3 + \pi^+$ $p + d \rightarrow He^3 + \pi^o$ } using emulsion technique		Finished New experiments requiring 10 shifts are planned
804	P. Preiswerk	Measurements on the primary specific ionisation to study the detection of relativistic increase		The work at the cyclotron is finished. Analysis of the cloud chamber pictures proceeding

Visiting team Experiments with the CERN Cyclotron

proposed up to September 15th 1959

Exp. No.	Visiting Team (Date of first proposal)	Type of experiment	Total no. of shifts required	Remarks
2	F.P.G. Valckx Utrecht (10.9.57)	Scattering of positive mesons by complex nuclei	75 (-10)	See attached copy of questionnaire dated 1.9.1959, F.P.G. Valckx.
3	Voss and Astbury Liverpool (18.3.57)	π^+-deuteron absorption using heavy water target	60	A new request is in preparation. Up to now only work on π^+ beam extraction
4a	Harwell + U.C. London (18.3.57)	Polarization effects in neutron-proton scattering at 150 MeV	48	See attached copy of questionnaire dated 2.9.1959
4b	Harwell + U.C. London (18.3.57)	Polarization of recoil protons from π^+ + p elastic collisions	40	See attached copy of questionnaire dated 2.9.1959, R.C. Hanna and F.F. Heymann.
9	P. Bassi Bologna (25.7.57)	H_2 bubble chamber (3 ℓ.) to be used to study pion production by pions	30 (-17½)	No new request received. 17½ shifts have been allotted in June and July

Exp. No.	Visiting Team (Date of first proposal)	Type of experiment	Total no. of shifts required	Remarks
12	Batty, Goldsack, Lock Birmingham (25.10.57)	Small angle scattering of protons by carbon and by aluminium using emulsion technique	3 x 1 day with 2-month intervals (-4 shifts)	A first exposure was done in April 1959
20	B. Hahn Fribourg (11.4.58)	Measurement of bubble densities in fluorocarbon bubble chamber	4 days	Documentation received, a new request is expected before 1.10.1959
21	P. Budini Trieste (14.4.58)	$\pi^- + p \rightarrow \pi^o + n$ and $\pi^- + p \rightarrow \pi^- + p$ reactions in energy range 160 to 300 MeV	60 shifts	No new request received
24	P.B. Jones Oxford	π^+ and π^- stars at 220 MeV in emulsions		Exposure done
27	M. Conversi Roma (15.12.58)	$P + \mu^- \rightarrow N + \nu$	15 shifts	
28	M. Scharff Copenhagen (23.1.59)	Emulsion exposure to a "standard" π^+ beam	3 shifts	Exposures postponed due to the change of channel arrangement

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Exp. No.	Visiting Team (Date of first proposal)	Type of experiment	Total no. of shifts required	Remarks
30	E. Amaldi Roma (19.1.59)	$p + d \rightarrow \begin{cases} He^3 + \pi^o \\ H^3 + \pi^+ \end{cases}$ with emulsions	4 shifts	No new request received
31	P. Brix Darmstadt (14.8.59)	μ-mesonic atoms a) Radii of heavy nuclei b) Helicity of the μ^--meson	 27 shifts 12 shifts	An increased beam intensity is preferred
32	A. Loria Padova (9.9.59)	$\pi^+ + p$ scattering at 90 and 150 MeV. Detection by 3 ℓ. propane bubble chamber	21 shifts	
33	M. Conversi Roma (16.9.59)	Search for $N + \mu^- \rightarrow N + e^-$	10 shifts	

Experimental Programme of the Synchro-Cyclotron including Visiting Teams

Actual use to mid-September 1959, proposed thereafter.

Number of 8 hour shifts (3 shifts/day)

		1959						1960					
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
131	Machine development	7	1½	0	4	6	8						
210	Maintenance	3½	6	10	9	7½	8						
210	Repairs	11½	4½	11	1½	8½	-						
Total non physics		22	12	21	14½	22	16						
	CERN Teams												
310	Citron	1	8	½	9	3							
311	Ledermann/ Farley	3	5½	2½	9	9	10						
321	Zavattini	8½	8½	25	6	2	5						
322	Merrison/ Fidecaro	4½	5	19	24½	----------							
323	Lundby		10	3		16		18	----------				
324	Harting/ Kluyver	22	4½	1	1	21	12	----------					
341	Goebel	2	3	1	2		2						
342	Rudstam	3	3	2	1½	½	2						
350	Gibson		5				2						
370	Various												
804	Preiswerk	4½			4	5	25*	----------					
Total CERN Teams		48½	52½	54	57	56½	58						

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*) During most of this time, by flipping up a target between the cloud chamber exposures, the beam could be used for the Ledermann - Farley experiment.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Visiting Teams												
Utrecht (Exp. 2)	4				3½	4						
Liverpool (Exp. 3)	1½	1½	4½									
Harwell (Exp. 4a)	7	4½	2½									
U.C. London (Exp. 4b)		6		7		10						
Bologna (Exp. 9)			6	11½								
Padova (Exp. 10)		5										
Roma (Exp. 11)												
Birmingham (Exp. 12)	4											
Birmingham (Exp. 19)												
Fribourg (Exp. 20)												
Trieste (Exp. 21)												
Roma (Exp. 27)												
Roma (Exp. 30)												
Darmstadt (Exp. 31)												
Padova (Exp. 32)												
Roma (Exp. 33)												
Various			½		1							
Totals :												
Visiting Teams	16½	17	13½	18½	4½	14	10	7	0	0	30	30
CERN Teams	48½	52½	54	57	56½	58	62	29	0	0	42	42
Total Physics	65	69½	67½	75½	61	72	72	36	0	0	72	72

Exp. No.	Visiting team	shifts req.
2	Utrecht	65
3	Liverpool	60
4a	Harwell — U.C. London	
4b	Harwell - U.C. London	40
9	Bologna	13
20	Fribourg	8
21	Trieste	60
27	Roma	15
30	Roma	4
31	Darmstadt	39
32	Padova	21
33	Roma	10
	Various	11

1959 1960

Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep

7 shifts/month

7 shifts/month

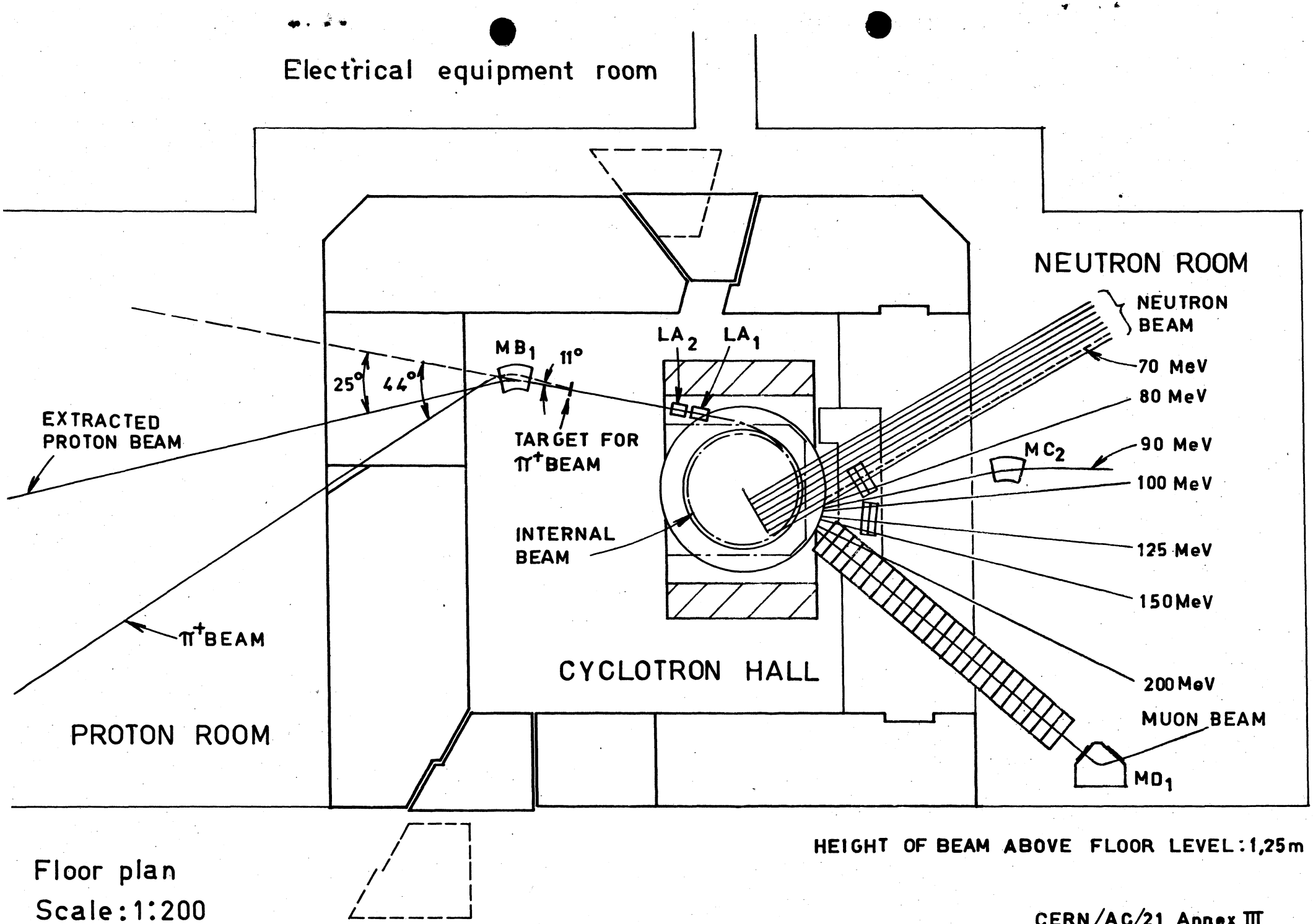
6 shifts/month

4 shifts/month

3 shifts/month

---------- = right of cyclotron time; ———— = Laboratory available

Preparation for π+ and p - beams
Maintenance and repairs
CERN Teams
Machine development
Visiting Teams
Shifts/month
80
60
40
20
0
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
1969
1970



HEIGHT OF BEAM ABOVE FLOOR LEVEL: 1,25m

Floor plan
Scale: 1:200

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